

Message Text

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ACTION EB-07

INFO OCT-01 EA-09 ISO-00 CCO-00 CIAE-00 OTPE-00 FCC-02

INR-07 NSAE-00 OC-06 USIA-15 COME-00 BIB-01 /048 W

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FM AMEMBASSY TOKYO

TO SECSTATE WASHDC 9271

UNCLAS TOKYO 10327

FOR EB/TT/TD: O'NEILL; INR-DDC

E.O. 11652: N/A

TAGS: ETEL, TECH, JA

SUBJECT: LASER COMMUNICATION SYSTEMS DEVELOPMENT

1. THE TOKYO ELECTRIC POWER COMPANY HAS ANNOUNCED IT WILL ADOPT A NEW LASER/FIBER OPTICS COMMUNICATION SYSTEM ON A TRIAL BASIS BETWEEN TWO TEPCO FACILITIES IN TOKYO. THE SYSTEM IS SAID TO BE ABLE TO OPERATE OVER A DISTANCE OF 10 KILOMETERS WITHOUT THE NEED FOR ANY RELAY DEVICES.

2. THE MAIN OBSTACLES TO FIBER OPTICS COMMUNICATION SYSTEMS (SHORT LASER LIFE, HIGH COST, AND DIFFICULTY IN JOINING GLASS CABLES) HAVE ALL BEEN OVERCOME, ACCORDING TO THE REPORT. THE LASER USED IN THE TEPCO SYSTEM IS SAID TO HAVE A 10,000 HOUR LIFE SPAN WHILE THE CABLE COST HAS BEEN LOWERED TO THAT OF CONVENTIONAL COAXIAL CABLE.

3. THE SYSTEM WAS DEVELOPED BY A TEAM OF RESEARCHERS FROM FURUKAWA ELECTRIC CO. AND FUJITSU LTD. WORKING TOGETHER AT THE INSTIGATION OF TEPCO. THE SYSTEM USES PULSE CODE MODULATION AND IS SAID TO BE SUITABLE TO DIRECT DATA TRANSMISSION.

4. TWO OTHER TWO-COMPANY TEAMS HAVE PRODUCED NEW COMMUNI-
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CATION SYSTEMS ALSO. SUMITOMO ELECTRIC INDUSTRIES, LTD. AND NIPPON ELECTRIC COMPANY HAVE PRODUCED A MULTIPLEX SYSTEM AND HITACHI, LTD. AND HITACHI CABLE, LTD. HAVE PRODUCED A TELECOMMUNICATIONS LASER SYSTEM. NO DETAILS WERE GIVEN ON EITHER OF THESE LATER SYSTEMS.

5. IN RELATED GOVERNMENTAL ACTIVITIES, NTT'S YOKOSUKA

LAB IS SAID TO HAVE TRANSMITTED DATA AT 32 MILLION BPS THROUGH A STEP-INDEX MULTIMODE OPTICAL FIBER CABLE FOR A DISTANCE OF 64 KM. DESIGN REPEATER LENGTH WAS 8 KM, BUT LOSSES WERE LOW ENOUGH TO PERMIT USE OF AN 11-KM REPEATER LENGTH. LIGHT SOURCE WAS 0.85 MICROMETER SEMI-CONDUCTOR LASER, WITH MATCHED APD DETECTOR. CABLE CONSISTED OF 8 FIBERS, EACH WITH 60 MICROMETER CONE DIAMETER AND 150 MICROMETER GLADDING DIAMETER. CENTER TENSION MEMBER WAS USED. SINGLE CABLE LENGTH WAS 1.0 KM, WITH WEIGHT OF 70 KG. AVERAGE SIGNAL LOSS WAS 3.0 DB/KM.

6. NHK IS REPORTED TO BE STUDYING USE OF OPTICAL FIBERS FOR SHORT-HAUL TRANSMISSION OF FINE-RESOLUTION WIDE SCREEN TV SIGNALS. 1125 SCANNING LINES IN FUTURE TECHNOLOGY TV TRANSMISSION WOULD REQUIRE BAND WIDTH EQUIVALENT TO 5 CONVENTIONAL CHANNELS, CAUSING AN EQUALIZATION PROBLEM. LIGHT SOURCE IS DIRECT INTENSITY MODULATED LED, AND A PIN PHOTODIODE IS USED FOR DEMODULATION. STEP-INDEX FIBERS WITH 5 DB/KM ATTENUATION ARE USED. FREQUENCY RESPONSE OF TRANSMITTER/RECEIVER IS SAID TO BE NEARLY FLAT UP TO 50 MHZ.

MANSFIELD

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Disposition Approved on Date:
Disposition Case Number: n/a
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